Type III Environmental Product Declaration No. 529/2024

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Gypsum mixtures Nida - Konin manufacturing plant

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ITB is the verified member of The European Platform for EPD program operators and LCA practitioner www. eco-platform.org

Basic information

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804+A2 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment and their aspects verified by the independent body according to ISO 14025. Basically, comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804+A2.

Life cycle analysis (LCA): A1-A4, C1-C4 and D modules in accordance with EN 15804+A2 (Cradle-to-Gate with options)

The year of preparing the EPD: 2024

Service Life: 50 years

PCR: ITB-PCR A

Declared unit: 1 kg

Reasons for performing LCA: B2B

Representativeness: Poland, 2022

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Manufacturer

Manufacturing plant in Konin

Etex is a leading provider of gypsum-based construction solutions. The Company is an ambitious player on the drywall systems market. Etex is a leader in innovation for safer building materials that protect buildings, infrastructure and home appliances. Moreover its lightweight solutions are efficient to install without using water, easy to maintain and insulative, which reduces waste and optimizes resource use. The company employs over 13 000 employees in 45 countries. It has 160 sites across the world and its annual revenue reaches EUR 3,7 billion. Etex Poland Sp. z o.o. has a separate legal identity within the Etex Group. The company in Poland employs over 290 people in three locations: at Leszcze and Konin production plants (covered by this EPD) and at the company's headquarters in Warsaw. Etex Poland makes every effort to ensure that the production of gypsum materials is carried out without harming the environment. Its production consumes relatively little energy therefore it does not cause dangerous environmental pollution. The Company is in charge of two separate brands – Siniat, which delivers lightweight systems solutions and Promat, which offers passive fire protection and high-performance insulation systems for the construction sector.

The intensive work of those involved in the creation of the documentation and its implementation, the implementation of corrective actions and the improvement of the company resulted in the ISO14001 certification - Environmental Management System.

Products description

Gypsum compounds and adhesives covered by this EPD are an integral part of drywall finishing work. Etex Poland, as a supplier of comprehensive solutions, offers a wide range of gypsum jointing compounds, skimming compounds, bonding compounds and plasters. The products are distinguished by their setting and processing times and resistance to moisture, as well as excellent performance regarding adhesion to gypsum board. This EPD includes products manufactured in Konin (Poland): Nida Start, Nida Finish, Nida Max, Nida Duo, Nida Perfect, Nida Optima, Nida Eco/Smart Eco, Nida Supra L, Supra L Manual, Nida Fix, Smart Fix, Planfix Fresh, Planfix Fresh B, Promat Filler Pro. They are developed and tested in cooperation with professional contractors. Gypsum mixtures produced at the Konin plant are made mainly from gypsum derived from flue gas desulfurization. Flue gas desulfurization is a process that provides a double benefit - a great quality product - synthetic gypsum - is produced, but there is also a reduction in atmospheric emissions. At our scale of production, this has real significance for the state of the environment. Synthetic gypsum has almost identical composition to natural gypsum.

All additional technical information about the product is available on the manufacturer's website and catalogue.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

The declared unit is 1 kg of gypsum mixtures product manufactured in Konin (averaged).

System boundary

The life cycle analysis of the declared products covers “Product Stage” A1-A3, A4, C2-C4+D modules in accordance with EN 15804 and ITB PCR A (cradle to gate with options). Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculation. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA.

Allocation

The allocation rules used for this EPD are based on general ITB’s document PCR A. Production of the covered gypsum products is a line process (as presented in Figure 2) conducted in the manufacturing plant located in Konin (Poland). Input and output data from the production is inventoried and allocated to the production on the mass basis. The declaration covers a wide range of gypsum mixtures. Their production resources and processing stages are basicly similar, so it is possible to average the production by product weight. The declaration refers to the average recipe of the product produced in Konin based on production inputs.

System limits

Minimum 99.0% input materials and 100% energy consumption (electricity, gas, LPG, other) were inventoried in a processing plant and were included in the calculation. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilized thermal energy, and electric power consumption, direct production waste and available emission measurements. Tires consumption for transport was not considered. Substances with a percentage share of less than 0.1% of total mass were excluded from the calculations.

Modules A1 and A2: Raw materials supply and transport

The modules A1 and A2 represent the extraction and processing of raw materials and transport to the production site. The average composition of the product based on the manufacturer’s declaration is: dolomite - natural calcium-magnesium carbon 25%, stucco gypsum 40%, slag gypsum synthetic 30%, cellulose esters 0.5%, polymers 1%, perlite 3%, other 0.5%. For A2 module (transport) European averages for fuel data are applied.

Module A3: Production

The product specific manufacturing process line is presented in Figure 2, an input gypsum/semi-product is processed to a required composition. The production process is automated and is based on receiving materials for production. Semi-finished products taken from silos via feeders go into a buffer chamber with a scale. Then the whole is mixed to form the right consistency and goes to the buffer chamber of the packaging machine. After packing into packages (bags or buckets), the product is placed on pallets.

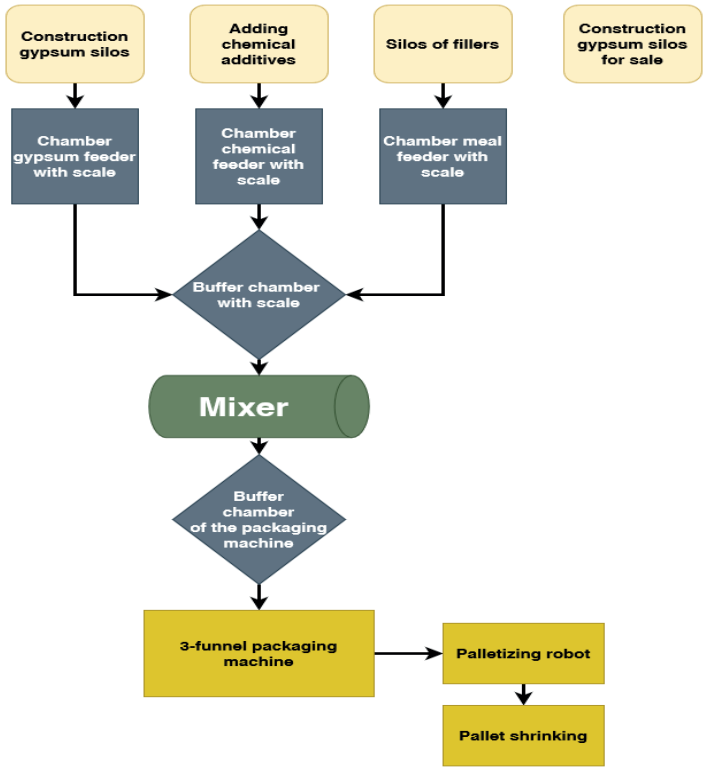

Figure 1 Manufacturing process scheme (A3)

Module A4: transport to consumer

Vehicle transport at distance 100 km is considered (emission standard: Euro 5) with 100% load capacity.

Modules C and D: End-of-life (EOL)

Due to the fact that the declaration covers a wide range of gypsum products for various purposes and usage scenarios, it is not possible to directly specify the de-construction technology and the amount of energy for disassembly in C1 module (so this module is very generic based on literature). The recycling potential of C3 module is 1% and it is assumed that 99% of the products will end up in a landfill – C4 module (Table 2). Module D presents credits resulting from the recycling of the gypsum (used for gypsum production).

Material	Material recovery	Recycling	Landfilling
Gypsum mixtures Nida	100%	1%	99%

Table 1 End-of-life scenario for the Gypsum mixtures and ready-mixes Nida

Electricity at end-of-life (module C) has been modelled using an average Polish electricity mix as the location where the product reaches end-of-life is unknown.

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2022 – 31.12.2022 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

Data quality

The data selected for LCA originate from ITB-LCI questionnaires completed by Etex Poland Sp. z o.o. and verified during data audit. No data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency is judged as good. The background data for the processes come from the following resources database Ecoinvent v.3.9.1 (perlite, limestone, gypsum synthetic dust, dolomite, carboxymethyl cellulose, silicate, cationic resin, titanium dioxide, polycarboxylates, copolymers, activated bentonite, LDPE, tetrafluoroethylene, paper, EUR-flat pallet). Specific (LCI) data quality analysis was a part of the input data verification. Where no background data was available, data gaps were complemented by manufacturer information and literature research.

Assumptions and estimates

The impacts of the representative products were aggregated using weighted average.

Calculation rules

LCA was performed using ITB-LCA tool developed in accordance with EN15804+A2. Emission of greenhouse gases was calculated using the IPCC 2013 GWP method with a 100-year horizon. Emission of acidifying substances, Emission of substances to water contributing to oxygen depletion, Emission of gases that contribute to the creation of ground-level ozone, Abiotic depletion, and ozone depletion emissions where all calculated with the CML-IA baseline method.

Additional information

Polish electricity (Eocinvent v 3.9.1 supplemented by actual national KOBIZE data) emission factor used is 0.685 kg CO2/kWh. As a general rule, no particular environmental or health protection measures other than those specified by law are necessary. The calculations took into account that a certain part of the energy purchased by the plant was purchased with a certificate of origin of renewable energy, the allocation of this energy is for the entire production.

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 kg of gypsum mixtures Nida components produced in Europe. The following life cycle modules (Table 2) were included in the analysis. The following tables 3-6 show the environmental impacts of the life cycle of selected modules (A1-A5+C1-C4+D).

Environmental assessment information (MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MD	MD	MND	MND	MND	MND	MND	MND	MND	MD	MD	MD	MD	MD

Table 2 System boundaries for the environmental characteristic of the product.

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	6.13E-02	3.17E-02	9.35E-02	1.86E-01	1.67E-02	3.43E-03	1.67E-02	8.34E-05	1.06E-02	-9.50E-03
Greenhouse potential - fossil	eq. kg CO_2	6.49E-02	3.16E-02	9.34E-02	1.90E-01	1.66E-02	3.43E-03	1.66E-02	8.31E-05	1.05E-02	-9.50E-03
Greenhouse potential - biogenic	eq. kg CO_2	-3.74E-03	1.08E-04	8.84E-05	-3.54E-03	5.68E-05	9.23E-06	5.68E-05	2.84E-07	3.19E-03	-5.70E-07
Global warming potential - land use and land use change	eq. kg CO_2	6.71E-05	1.24E-05	5.75E-06	8.52E-05	6.52E-06	5.36E-07	6.52E-06	3.26E-08	1.07E-05	-4.36E-05
Stratospheric ozone depletion potential	eq. kg CFC 11	4.43E-09	7.31E-09	4.19E-09	1.59E-08	3.85E-09	1.88E-11	3.85E-09	1.92E-11	3.20E-09	-1.79E-09
Soil and water acidification potential	eq. mol H+	5.07E-04	1.28E-04	3.13E-04	9.48E-04	6.75E-05	3.62E-05	6.75E-05	3.37E-07	8.88E-05	-3.99E-04
Eutrophication potential - freshwater	eq. kg P	2.09E-05	2.12E-06	4.42E-05	6.72E-05	1.12E-06	5.90E-06	1.12E-06	5.59E-09	3.06E-06	-1.45E-05
Eutrophication potential - seawater	eq. kg N	1.37E-04	3.87E-05	4.61E-05	2.22E-04	2.04E-05	5.13E-06	2.04E-05	1.02E-07	3.06E-05	-3.54E-05
Eutrophication potential - terrestrial	eq. mol N	1.54E-03	4.22E-04	4.18E-04	2.38E-03	2.22E-04	4.47E-05	2.22E-04	1.11E-06	3.33E-04	-4.76E-04
Potential for photochemical ozone synthesis	eq. kg NMVOC	4.73E-04	1.29E-04	1.36E-04	7.38E-04	6.80E-05	1.29E-05	6.80E-05	3.40E-07	9.64E-05	-1.14E-04
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	7.01E-05	1.12E-07	3.90E-08	7.03E-05	5.89E-08	1.29E-09	5.89E-08	2.95E-10	3.56E-08	-2.83E-06
Abiotic depletion potential - fossil fuels	MJ	1.69E+00	4.69E-01	9.68E-01	3.13E+00	2.47E-01	5.41E-02	2.47E-01	1.23E-03	2.43E-01	-3.34E-01
Water deprivation potential	eq. m^3	3.15E-02	2.17E-03	8.03E-03	4.17E-02	1.14E-03	1.03E-03	1.14E-03	5.70E-06	1.41E-03	-2.47E-02

Table 3 Life cycle assessment (LCA) results for specific product – environmental impacts (DU: 1 kg)

Indicator	Unit	A1-A3	A4	C1-C4	D
Particulate matter	disease incidence	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA

Table 4 Life cycle assessment (LCA) results for specific product – additional impacts indicators (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.44E-01	6.72E-03	3.29E-02	1.84E-01	3.54E-03	4.45E-03	3.54E-03	1.77E-05	3.84E-02	-2.58E-01
Consumption of renewable primary energy resources used as raw materials	MJ	7.57E-02	0.00E+00	0.00E+00	7.57E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.57E-02
Total consumption of renewable primary energy resources	MJ	2.20E-01	6.72E-03	3.42E-02	2.61E-01	3.54E-03	4.45E-03	3.54E-03	1.77E-05	3.84E-02	-3.34E-01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.42E+00	4.69E-01	4.00E-01	2.29E+00	2.47E-01	5.41E-02	2.47E-01	1.23E-03	3.34E-01	-1.68E-01
Consumption of non-renewable primary energy resources used as raw materials	MJ	4.08E-01	0.00E+00	0.00E+00	4.08E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.30E+00
Total consumption of non-renewable primary energy resources	MJ	1.83E+00	4.69E-01	1.03E+00	3.32E+00	2.47E-01	5.41E-02	2.47E-01	1.23E-03	3.34E-01	-2.47E+00
Consumption of secondary materials	kg	4.80E-01	1.57E-04	7.90E-05	4.80E-01	8.27E-05	4.70E-06	8.27E-05	4.14E-07	2.02E-04	-2.25E-01
Consumption of renew. secondary fuels	MJ	6.25E-04	1.73E-06	2.78E-07	6.27E-04	9.11E-07	2.37E-08	9.11E-07	4.56E-09	1.23E-05	-7.82E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater	m^3	8.71E-04	5.90E-05	1.16E-03	2.09E-03	3.10E-05	1.55E-04	3.10E-05	1.55E-07	6.05E-04	-1.22E-03

Table 5 Life cycle assessment (LCA) results for specific product - the resource use (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	2.01E-02	5.26E-04	3.10E-03	2.37E-02	4.19E-04	4.19E-04	2.77E-04	1.38E-06	2.33E-03	-2.01E-02
Non-hazar-dous waste	kg	6.53E-02	9.34E-03	2.10E-01	2.84E-01	2.82E-02	2.82E-02	4.92E-03	2.46E-05	6.50E-02	-6.53E-02
Radioactive waste	kg	1.24E-06	3.50E-08	1.79E-07	1.45E-06	8.12E-09	8.12E-09	1.84E-08	9.21E-11	8.81E-07	-1.24E-06
Compo-nents for re-use	kg	0.00E+00	0.00E+00	1.96E-03	1.96E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	1.37E-05	1.45E-06	1.00E-03	1.02E-03	3.63E-07	3.63E-07	7.64E-07	3.82E-09	4.52E-06	-1.37E-05
Materials for energy recovery	kg	4.63E-08	1.17E-08	8.52E-09	6.66E-08	5.83E-10	5.83E-10	6.18E-09	3.09E-11	4.20E-07	-4.63E-08
Exported Energy	MJ	6.58E-03	0.00E+00	1.55E-03	8.13E-03	1.73E-04	1.73E-04	0.00E+00	0.00E+00	9.07E-04	-6.58E-03

Table 6 Life cycle assessment (LCA) results for specific product – waste categories (DU: 1 kg)

Verification

The process of verification of this EPD is in accordance with ISO 14025 and ISO 21930.
After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 (sub clause 8.1.3.) [x] external [ ] internal
External verification of EPD: Halina Prejzner, PhD. Eng. LCI audit and verification: Michał Chwedaczuk, M.Sc. Eng. LCA, LCI audit and input data verification: Michał Piasecki, PhD., D.Sc., eng.

Note 1: The declaration owner has the sole ownership, liability, and responsibility for the for the information provided and contained in EPD. Declarations of construction products may not be comparable if they do not comply with EN 15804+A2. For further information about comparability, see EN 15804+A2 and ISO 14025.

Note 2: Note: ITB is a public Research Organization and Notified Body (EC Reg. no 1488) to the European Commission and to other Member States of the European Union designated for the tasks concerning the assessment of building products' performance. ITB acts as the independent, third-party verification organization (ISO 17025/17065/17029). ITB-EPD program is recognized and registered member of The European Platform - Association of EPD program operators and ITB-EPD declarations are registered and stored in the international ECO-PORTAL.

Normative references

- ITB PCR A General Product Category Rules for Construction Products
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets – Service life planning – Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life and service-life estimation
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- KOBiZE Wskaźniki emisyjności CO2, SO2, NOx, CO i pyłu całkowitego dla energii elektrycznej. December 2022

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CERTIFICATE № 528/2024
of TYPE III ENVIRONMENTAL DECLARATION

Products:

Gypsum mixtures Nida - Konin manufacturing plant

Manufacturer:

Etex Poland Sp. z o.o.
ul. Przecławska 8, 03-879 Warsaw, Poland

confirms the correctness of the data included in the development of
Type III Environmental Declaration and accordance with the requirements of the standard

EN 15804+A2

Sustainability of construction works.
Environmental product declarations.
Core rules for the product category of construction products.

This certificate, issued on 28th February 2024 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics and Environment Department
Agnieszka Winkler-Skalna, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, February 2024